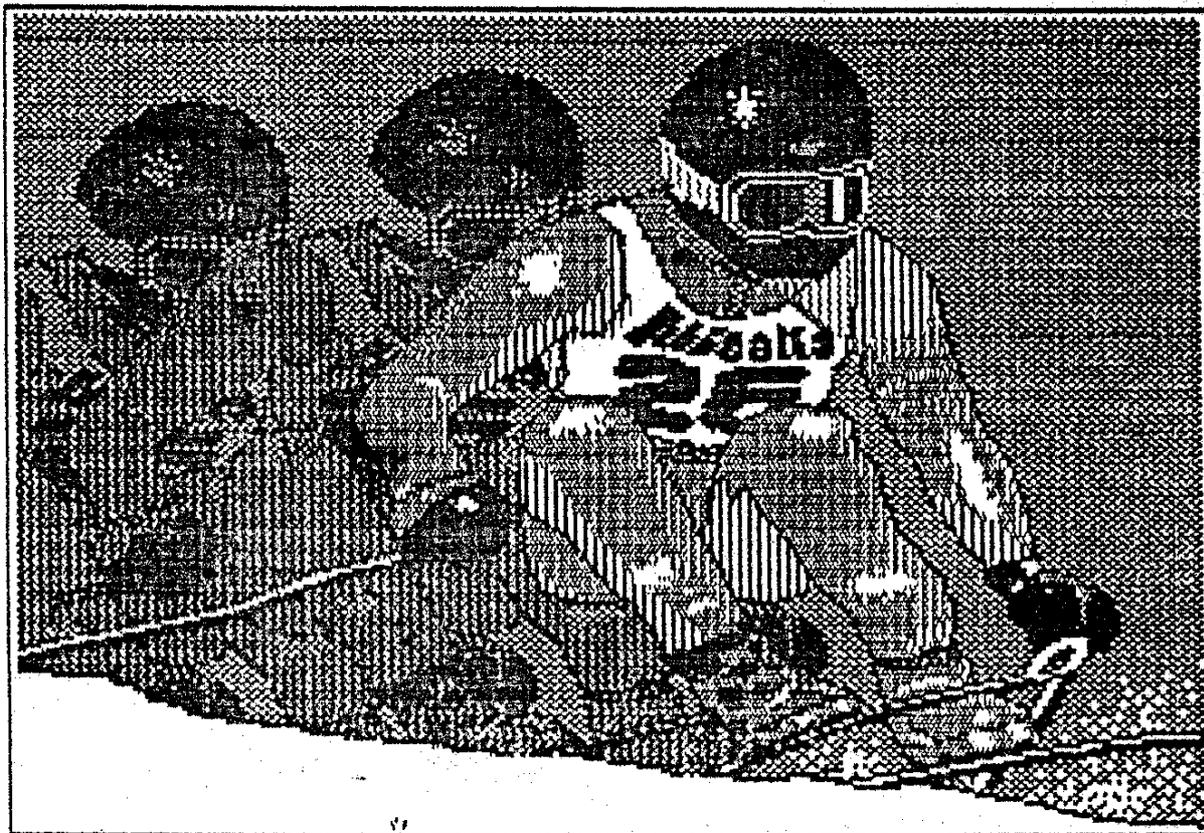# FORMAT

THE NEWSLETTER
of the
INDEPENDENT
DISCiPLE USER GROUP

ISSUE #4 - NOVEMBER 1987

EVEN FASTER THAN A DOWNHILL SKIER
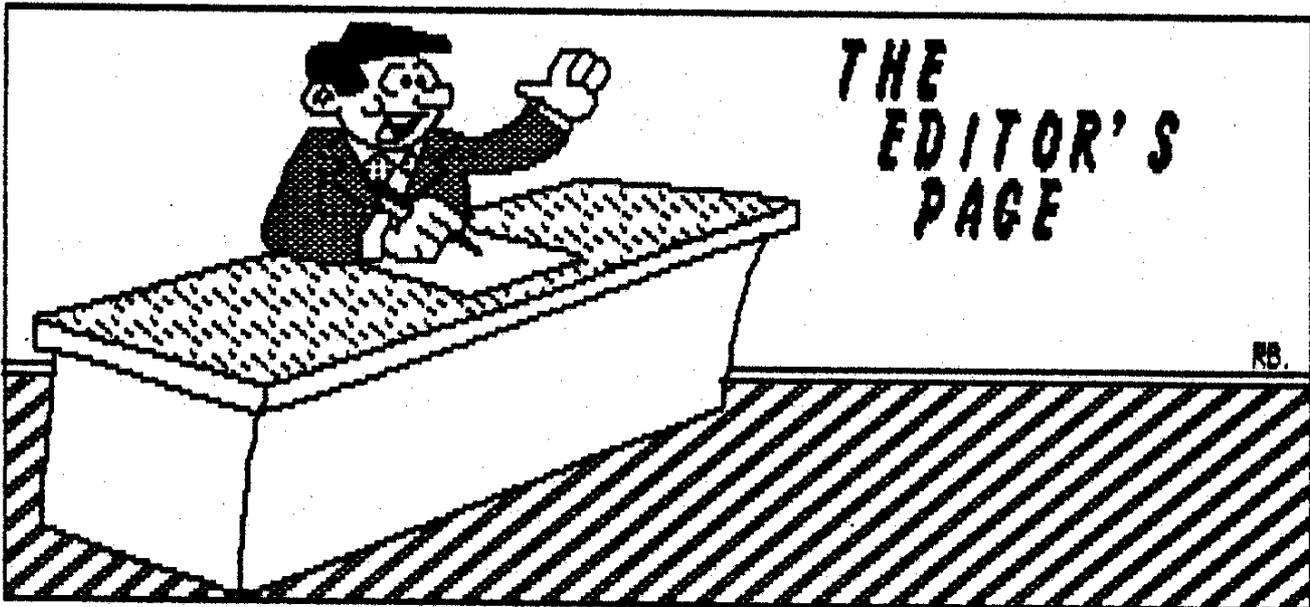
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ISSUE #4 - NOVEMBER 1987

THE EDITOR'S PAGE

First item this month is an apology for mis-spelling the name of Alan Miles in the last issue, my only excuse is in having two other friends (yes I do have some) who spell their name Alen. So where you find ALEN in issue 3 please read ALAN. There were also, I'm sorry to say, a few other mistakes in issue 3 and you will find corrections later in this issue.

We have been experiencing some problems with the British postal service over the last few months. We try to send out each issue during the last few days of the month/first few days of the next, so this issue will go out to most people between the 29th October and the 4th November. I would like to hear from UK members who receive their copy later than 5 days after the date of the postmark, this will enable me to lodge a formal complaint with the post office. It may not do any good but at least I can try.

And now some good news. Membership of INDUG has now topped the 400 mark. Its fantastic to have reached such a milestone just five months after the first copies of the Introductory issue went out. Whats more there seems to be no drop-off in growth, membership forms are still arriving every day from all over the world. I look forward to the next landmark of 500 which can't be far away now.

The response to the Miles Gordon Technology SPECIAL OFFER LEAFLET last month has been very good. A new leaflet is being prepared for next months issue, with even more bargains for club members. All items on the current leaflet are still available, but get your orders in quick to avoid the Christmas postal delays.

Next month will see our first Christmas Issue and there will be a few surprises in store. We will also be starting a back issue service for those members who have missed out on the early issues of FORMAT.

See you next month.

Bob Brenchley. Editor.

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DISCiPLE NEWS.

PLUS D FROM MGT

Miles Gordon Technology have done it again. At the end of November MGT will launch their new product, the PLUS D, a budget disc/printer interface aimed at the games player. Advertising will commence in mid November with first units being shipped at the end of the month.

The PLUS D is software compatable with the DISCiPLE, the GDOS operating system being standard on both, but it is aimed at a very different market. Alan Miles of MGT said "The PLUS D will provide an upgrade path for Spectrum owners that the Plus 3 will not", he went on to say "Unlike the Plus 3 the PLUS D will run the vast majority of games and convert them to disc without the need for a separate interface".

The PLUS D has a simplified disc interface with only double density operation supported, so some ultra cheap drives are not compatable. The Network ports, Joystick interfaces, Inhibit botton and the 'through' edge connector have all been dropped in the push to cut costs. If a joystick is needed a separate interface must be fitted, without the edge connector a ribbon cable with duel outlets will be required (or a joystick interface with a through connector). The loss of the DISCiPLEs inhibit button means Interface One and Microdrives will not work with the PLUS D.

With the increased market given by the PLUS D software companies will now have an added incentive to convert programs to run under GDOS.

For further details contact Miles Gordon Technology at their new address:- Unit 4, Chesterton Mill, French's Road, Cambridge, CB4 3NP.

NOAA TRACKING

DISCiPLE users interested in receiving pictures from the NOAA Weather Satellites will be pleased to hear of the utility programs just released by Grant Dixon of Ross-on-Wye.

The first shows a map of the northern hemisphere on which is superimposed the satellites track, the area in which radio reception is possible and the lateral limits of the picture display. This is done for any value of longitude of equator crossing.

The second program shows a map of Europe (using conical projection), the user supplies the equator crossing value and a time since crossing. The program then draws a dotted line up to the satellites current position and, thereafter, the track is plotted in real time by updating the position every three seconds.

Both programs are available on the same cassette (or 5.25" 80 track disc) for £7.50 from Grant Dixon, Kyrles Cross, Peterstow, Ross-on-Wye, Herefordshire, HR9 6LD.

NEXT MICROFAIR

An advanced note for all your diaries, Saturday 12th December, that's the date of the next ZX Microfair in London. INDUG will be there so don't forget the date.

STOCKS AND SHARES

A topical one is this, OCP are in the final stages of negotiating for a new Stocks and Shares management program for the Spectrum. Perhaps Lloyds of London should invest in a few Spectums (with DISCiPLEs of course) the Stock Market may run a little better if they do.

GLITCH REPORT

Last months issue contained a few errors for which I humbly appologise. I list below those I have found (I hope there are no more) and trust no one has been too inconvenienced by them.

First the printer managed to lose the stick-on crediting Keith Naylor with the RS232 article. The blank space was not noticed until after the bulk of the mags went out. I also managed to introduce some errors into the circuit diagram when I redrew it on the computer for publication. The output from U1 thats connected to the RESET line on U4 is pin 3. The output from U1 connected to pin 2 on U3 is pin 8. The 1000pf capacitors connected to U6 (top right of the diagram) connect to pins 5 & 3 and the other ends connect to the earth rail. The 39k resistors should also connect to pins 5 & 3 not to the ends of the capacitors. The baud rate switch SW1 should have been labelled 4,3,2,1 reading from top to bottom. And finaly in the baud rate table 600 baud should read closed; open; open; closed. Sorry Keith it wont happen again.

Next we come to the UPDATE article on page 17. The first POKE in line 70 should read POKE pnt+1074,33 not zero. This error leads to Basic programs saved with an autorun line number not autorunning (could this be a new facility I wonder). On the subject of UPDATE several members have asked what the ammendments to GDOS actually do. Well lines 50-52 cure a problem in V3a where some games corrupted the screen when a Snapshot was reloaded. This patch does mean that on some games the BORDER colour is not restored on reloading. Lines 60-70 get round an error in the FORMAT command where the system freezes in about 1 in 3 cases, it changes the point in the main ROM where GDOS retunes when executing a Basic command. Line 100 changes the version letter from 'a' to 'b'. So now you know.

Finally on Page 13, in the listing of TASTYPE, lines 9730 and 9740 have somehow merged into one. The break comes after the GOTO 9720.

Lets hope thats the lot.

PRINTING WITH MACHINE CODE

By Francis G Miles

The DISCiPLE handbook gives a command code 39 hex (COMMAND CODES, page 55 on my very early edition) for sending a single byte to the printer from the 'A' register. Since the interface does not require initializing, and the ROM routine includes its own check to see whether the printer is currently "busy", the machine code to print a byte can be very simple indeed:

```
          LINE                              DECIMAL  POKE

FF01 CF   00010  PBYTE  RST  08H            65280    207
FF01 39   00020         DEFB 39H            65281    57
FF03 C9   00030         RET                 65282    201
```

However, it is sometimes desirable to have a separate "busy" routine. E.g. in my WORD MANAGER program, when the printer is running on the interrupt (SLOW PRINT), it is very important that the interrupt subroutine should not get held up waiting for the printer; otherwise the running of the editing part of the program, which goes on between interrupts, goes very much by fits and starts in a highly disconcerting way.

I used the following "busy" routine:

```
FF04 DB    00040  BUSY   IN   A,(1FH)       65283    219
                                            65284    31

FF06 EE40  00050         XOR  01000000B     65285    238
                                            65286    64

FF08 CB77  00060         BIT  6,A           65287    203
                                            65288    119

FF09 C9    00070         RET                65289    201
```

Bit 6 of the input from port 1F is set if the printer is ready, and zero if it's busy; thats the reverse of what's wanted in my

program (and most others I know of), so line 60 is put in to reverse it.

This works fine. I was amazed to find that these two routines will run the printer even when the DISCiPLE is disabled - I don't understand this at all.

Situations can arise in which calling in the DISCiPLE ROM will interfere with the running of other parts of the machine code program. It is possible to send a byte to the printer without using RST 08H and the hook code:

```
FF00 47      00010   PBYTE  LD   B,A          65280   71
             00020   ;Check for "busy"
FF01 DB1F    00030   BUSY   IN   A,(1FH)       65281   219
                                               65282   31
FF03 CB77    00040          BIT  6,A           65283   203
                                               65284   119
FF05 28FA    00050          JR   Z,BUSY        65285   40
                                               65286   250
             00060   ;Recover A and output
FF07 78      00070          LD   A,B           65287   120
FF08 D3FB    00080          OUT  (0FBH),A      65288   211
                                               65289   251
FF0A 3E40    00090          LD   A,40H         64290   62
                                               65291   64
FF0C D31F    00100          OUT  (1FH),A       65292   211
                                               65293   31
FF0E E6BF    00110          AND  0BFH          65294   230
                                               65295   191
FF10 D31F    00120          OUT  (1FH),A       65296   211
                                               65297   31
             00130   ;Return with A Unchanged
FF12 78      00140          LD   A,B           65298   120
FF13 C9      00150          RET                65299   201
```

This routine includes its own "busy" loop (lines 30-50), but it can be taken out and put in a separate routine as shown above.

Many commercial programs require machine code printer routines, sometimes called "printer drivers" and I hope that this article will enable readers to taylor such programs to the DISCiPLE with ease. All the routines listed here are relocatable, so in most cases one could be used without alteration. The only other routine you may need, which I have not included in my listing, is a test for the BREAK key in the 'Busy' loop to avoid a freeze if the printer is not on-line. This is done for you by the DISCiPLE if you use the RST Command Code call.

I must acknowledge the help of Bruce Gordon in figuring out these routines.

Francis Miles is the author of WORD MANAGER and ADDRESS MANAGER both produced under the OCP lable.

DISK_FILE

This program, produced by a new Bristol based company called REDCLIFFE SOFTWARE, will enable the user to catalogue up to 2,500 entries spread over a maximum 255 discs. All this is carried out easily without following long tedious routes.

The software comes on cassette, which helps to keep the cost down and avoids problems with different disc formats. By following the easy step-by-step instructions (simply insert a formatted disc in drive 1, save your system file onto it and LOAD the tape) you produce the disc version of the program which you then use on all future occasions.

A menu with ten options is displayed when the program is loaded from disc and by following the prompts, a catalogue of all your discs is created or updated. After sorting the records into alphabetical order (or disc order if you wish) these can be printed or saved to disc. All disc changes are prompted for on screen. After using this utility for only a few minutes, I found it very easy to understand without having to retrace my steps on the well written instruction leaflet.

The only problem I found was that it was too easy to break out of the program by mistake, i.e. by pressing a key for too long. Also I could not see the advantage of the clock feature, displayed in the right hand corner of the screen.

A useful addition would be an indication of the remaining free space for each disc when listed. This could be incorporated in option 2 and 4 (Display & Print disc contents) which I'm sure would be a great asset to users when they need to save additional programs onto a disc. Of course the full potential of this system would come into operation if the user updates his catalogue file regularly with DISK-FILE.

To sum up, DISK-FILE is one of the best disc catalogue systems so far produced for the DISCiPLE, the programmers who were associated in writing it must be congratulated. If you have more than a handfull of discs, it's a utility well worth sending away for. I shall enjoy using this utility myself for setting up my library of discs.

GRAPHICS.....................N/A	REDCLIFFE SOFTWARE,	
PRESENTATION ON SCREEN.....7/10	108 Broughton House,	
USE AS UTILITY.............9/10	Somerset Street,	
INSTRUCTIONS..............10/10	Redcliffe,	
VALUE FOR MONEY............8/10	Bristol, BS1 6RY.	
OVERALL RATING.............9/10	PRICE £5.95	

Reviewed by JAD.

✳ PRINTER SET ✳

This is a short utility to enable the setting up of a printer (ideal for use before doing an LLIST). It works with an Epson type printer but the control codes could be altered to suit any other printer.

Type in the program and save to disc. To use, just RUN and then press the numeric key to match the function required. Illegal combinations will not be allowed by the program. New features could be added, with new keys chosen as controls, but the screen layout may need changing.

```
  5 REM ** PRINT SET **
  6 REM By Dave Drake.
  7 REM
 10 CLS : BORDER 0: INK 6: PAPER 0
 20 LET q$="            ": REM q$=blue paper(extn mode 1)+10 space
s
 30 LET w$="": LET n$="": LET o$="": LET m$="": LET i$=q$
 35 LET z$=CHR$ 27
 40 POKE @6,1
 45 LPRINT z$;CHR$ 64;
 50 CLS : PRINT "      PRINTER CHARACTER SELECT"'"--------------
----------------"'''"          ON              OFF"''
 60 PRINT "      1     ENLARGED    2";AT 6,11; OVER 1;N$''
 70 PRINT "      3     CONDENSED   4";AT 8,11; OVER 1;O$''
 80 PRINT "      5     EMPHASISED  6";AT 10,11; OVER 1;M$''
 90 PRINT "      7     PICA        8";AT 12,11; OVER 1;I$''
100 PRINT "      0     EXIT"
110 PAUSE 0: LET X$=INKEY$
120 IF X$="1" THEN LPRINT z$;CHR$ 87;CHR$ 1;: LET N$=Q$: GOSUB 2
20
130 IF X$="2" THEN LPRINT z$;CHR$ 87;CHR$ 0;: LET N$=W$: GOSUB 2
20
140 IF X$="3" THEN LPRINT CHR$ 15;: LET O$=Q$: GOSUB 220
150 IF X$="4" THEN LPRINT CHR$ 18;: LET O$=W$: GOSUB 220
160 IF X$="5" THEN LPRINT z$;CHR$ 69;: LET M$=Q$: LET I$=W$: GOS
UB 220
170 IF X$="6" THEN LPRINT z$;CHR$ 70;: LET M$=W$: LET I$=Q$: GOS
UB 220
180 IF X$="7" THEN LPRINT z$;CHR$ 70;CHR$ 18;: LET M$=W$: LET I$
=Q$: GOSUB 220
190 IF X$="8" THEN LPRINT z$;CHR$ 69;: LET M$=Q$: LET I$=W$: GOS
UB 220
200 IF X$="0" THEN POKE @6,0: GOSUB 220: INK 0: PAPER 7: BORDER
7: CLS : STOP
205 IF M$=Q$ THEN LET O$=W$: LPRINT CHR$ 18;
210 GOTO 50
220 BEEP .1,20: RETURN
```

DAVE DRAKE.

* TAPE ARCHIVE *

A DISC TO TAPE BACK-UP UTILITY

By: John Hamilton.

This BASIC program, called 'ARCHIVE', will perform a disc to tape dump and restore at a sector level. As I only have one disc drive, I need to have something which will allow a complete backup to be taken. It runs at about 7.9 sectors per minute, so a full 1600 sectors would take nearly 3.5 hours, but none of my discs have yet filled a C90 cassette.

Machine code is used, but is stored in DATA statements (so take care typing in the last part of the listing). Disc I/O is all done in BASIC and so GDOS V3 will be required.

```
1000 REM DISC TO TAPE ARCHIVE PROGRAM BY: J.F.HAMILTON.
1010 READ w$: LET c=VAL w$(2 TO ): CLEAR c-1
1020 LET l=1: LET O=0: LET g=256
1030 LET a=PEEK 23730+g*PEEK 23731+l
1040 LET bmap=a
1050 LET used=a+3
1060 LET save=a+6
1070 LET load=a+9
1080 LET adrv=a+12
1090 LET adrc=a+23
1100 LET adrh=a+24
1110 LET adrs=a+25
1120 LET data=a+26
1130 DEF FN d(d$)=("0"<=d$ AND d$<="9")*(CODE d$-CODE "0")+("A"<
=d$ AND d$<="F")*(10+CODE d$-CODE "A")
1140 DIM b$(32): DIM c$(2): DIM u$(11): DIM v$(LEN u$)
1150 LET c1=4: LET c2=25: LET c3=20
1160 LET er=19
1170 REM TIMING CONSTANTS
1180 LET tc=60: LET th=210: LET ts=3: LET to=50: REM PAUSE CYCLE
S FOR SECTOR RESTORE
1190 LET ta=(1.04+2+526/170.7)/60: REM OVERHEAD+DATA LEADER+DATA
   BLOCK
1200 LET tb=ta+(tc/10+th/800+ts*5.5+to)/3000: REM TOTAL MINS/SEC
TOR
1210 CLS : PRINT INVERSE 1;" DISC DUMP/RESTORE  PROGRAM  (C)1987
          J F HAMILTON "
1220 REM INITIALISE M/C CODE
1230 PRINT #0;AT O,O;"STORING CODE AT";: RESTORE
1240 READ w$: IF w$(1)="#" THEN LET c=VAL w$(2 TO ): GO TO 1240
1250 IF w$="*" THEN GO TO 1700
1260 FOR i=1 TO LEN w$-1 STEP 2
1270 PRINT #0;AT 1,0,c
1280 POKE c,16*FN d(w$(i))+FN d(w$(i+1)): LET c=c+1
1290 NEXT i
1300 GO TO 1240
```

```
1310 REM PRINT TITLES
1320 FOR i=4 TO 20: PRINT AT i,0;b$;: NEXT i
1330 PRINT AT 4,c1;v$;AT 6,c1;"TRACK";AT 7,c1;"SIDE";AT 8,c1;"SE
CTOR";
1340 PRINT AT 12,c1;"SECTORS WRITTEN";AT 13,c1;"    ""      TO GO
";AT 14,c1;"   ""      IN USE";
1350 RETURN
1360 REM PRINT STATS
1370 LET n=n+1
1380 PRINT AT 10,c3;"WRITTEN";AT 12,c2;n;c$;AT 13,c2;u-n;c$;
1390 RETURN
1400 REM LOAD RECORD FROM TAPE
1410 LET r=USR load
1420 IF r=0 THEN GO TO 1450
1430 PRINT AT er,c1;"TAPE READ ERROR"
1440 GO TO 2490
1450 LET c=adrv
1460 FOR i=1 TO LEN u$: LET u$(i)=CHR$ PEEK c: LET c=c+1: NEXT i
1470 IF u$=v$ THEN GO TO 1510
1480 PRINT AT er,c1;"TAPE LABEL MISMATCH"'" IS:";u$;
1490 GO TO 2490
1500 REM GET C/H/S FROM BUFFER
1510 LET c=PEEK adrc: PRINT AT 6,c2;c;c$;
1520 LET h=PEEK adrh: PRINT AT 7,c2;h;c$;
1530 LET s=PEEK adrs: PRINT AT 8,c2;s;c$;
1540 PRINT AT 10,c3;"          ";
1550 RETURN
1560 REM SET COUNTERS IN HDR & TLR RECORDS
1570 POKE adrc,0: POKE adrh,0: POKE adrs,0
1580 POKE (data+1),INT (u/g)
1590 POKE data,u-g*PEEK (data+1)
1600 RETURN
1610 REM DISC LOAD / WAIT
1620 PRINT #0;AT 0,0;"LOAD DISC FOR ";a$,"PRESS ENTER WHEN READY
"
1630 BEEP .05,1: PAUSE 5
1640 IF INKEY$="" THEN GO TO 1630
1650 PRINT #0;AT 0,0;b$;b$;
1660 RETURN
1670 REM RESTART
1680 PRINT AT 18,c1; INVERSE 1;"DISC ";a$;" COMPLETED";b$(LEN a$
 TO 8); INVERSE 0'"TO QUIT, PRESS ENTER, OR ...";
1690 REM START - GET VOL REF
1700 INPUT "VOLUME REFERENCE (max ";(LEN v$);" chars)  >"; LINE
v$
1710 IF v$="" THEN STOP
1720 PRINT AT 18,c1;b$;b$;
1730 LET n=0: LET cx=-1: LET hx=-1
1740 INPUT "DUMP / RESTORE ? "; LINE w$
1750 IF w$="d" OR w$="D" THEN GO TO 1790
1760 IF w$="r" OR w$="R" THEN GO TO 2280
1770 BEEP .05,1: GO TO 1740
1780 REM DUMP TO TAPE
1790 LET a$="DUMP": GO SUB 1620
1800 PRINT #0;AT 0,0;"SCANNING DISC DIRECTORY"
1810 LET c=adrv
1820 FOR i=1 TO LEN v$: POKE c,CODE v$(i): LET c=c+1: NEXT i
1830 REM INITIALISE MAP
```

```
1840 LET c=a+538
1850 FOR i=1 TO 5: POKE c,255: LET c=c+1: NEXT i
1860 FOR i=1 TO 195: POKE c,O: LET c=c+1: NEXT i
1870 FOR c=O TO 3: FOR s=1 TO 10
1880 LOAD @1,c,s,data
1890 LET r=USR bmap
1900 NEXT s: NEXT c
1910 GO SUB 1320: PRINT AT 16,c1;"TAPE LEFT (min)";AT 18,c1;"TOT
AL REQUIRED (min)";
1920 LET u=USR used
1930 PRINT AT 14,c2;u;AT 18,c2;1+INT (tb*u);
1940 REM START OF TAPE
1950 INPUT "LENGTH OF TAPE SIDE, IN MINUTES >";t
1960 PRINT #0;AT O,O;"Start tape, press any key"
1970 PAUSE O: PRINT #0;AT O,O;b$;
1980 IF n>O THEN GO TO 2070
1990 REM SAVE DUMP HEADER
2000 GO SUB 1570: REM TOTAL SECTORS USED
2010 POKE (data+2),PEEK (a+844): REM CYLS
2020 POKE (data+3),PEEK (a+852): REM SIDES
2030 LET r=USR save: LET t=t-ta
2040 PAUSE 50: LET t=t-0.0167
2050 LET n=O: POKE adrs,1
2060 REM LOAD NEXT SECTOR
2070 GO SUB 1510
2080 LOAD @1,c+128*h,s,data
2090 PRINT AT 10,c3;"   READ";
2100 LET d=tc*(c<>cx)+th*(h<>hx)+ts*s+to
2110 LET cx=c: LET hx=h
2120 LET r=USR save: LET t=t-ta
2130 GO SUB 1370
2140 PAUSE d: LET t=t-d/3000
2150 PRINT AT 16,c2;INT t;c$;
2160 IF r=2 THEN GO TO 2230
2170 IF t>O THEN GO TO 2070
2180 REM END OF TAPE
2190 PRINT #0;AT O,O; FLASH 1;"REPLACE TAPE, THEN PRESS    ENTER"
2200 GO SUB 1630
2210 GO TO 1950
2220 REM END OF DUMP - WRITE TRAILER RECORD
2230 IF u<>n THEN GO TO 2480
2240 GO SUB 1570
2250 LET r=USR save
2260 GO TO 1680
2270 REM RESTORE FROM TAPE
2280 LET a$="RESTORE": GO SUB 1620
2290 PRINT AT er,O;"DISC WILL BE FORMATTED ..";
2300 FORMAT d1
2310 PRINT AT er,c1;b$;
2320 GO SUB 1320: PRINT #0;AT O,O;"Start tape"
2330 GO SUB 1410
2340 PRINT #0;AT O,O;b$
2350 LET u=PEEK data+g*PEEK (data+1)
2360 PRINT AT 14,c2;u;
2370 IF (c+h+s)=O AND 40<=u AND u<=1600 THEN GO TO 2400
2380 PRINT AT er,c1;"INVALID HEADER";
2390 GO TO 2490
2400 GO SUB 1410
```

```
2410 PRINT AT 10,c3;"   READ";
2420 IF (c+h+s)=O THEN GO TO 2460
2430 SAVE @1,c+128*h,s,data
2440 GO SUB 1370
2450 GO TO 2400
2460 IF u<>n THEN GO TO 2480
2470 GO TO 1680
2480 PRINT AT er,c1;"SECTOR COUNT ERROR"
2490 PRINT AT er,O; OVER 1; FLASH 1;b$;b$;
2500 GO SUB 1630
2510 STOP
3984 REM MACHINE CODE LOADED AT
3992 DATA "#64000"
4000 DATA "C3E2FCC3FFFCC32A"
4008 DATA "FDC317FD"
4738 DATA "#64738"
4746 DATA "06C31129FA211FFCC5D5E51AB6771323"
4762 DATA "10F9E1D1C1141AB677132310F90EC811"
4778 DATA "0000211AFC7E06081F30011310FA230D"
4794 DATA "20F3424BC93EFF37110E02DD210CFACD"
4810 DATA "5605010000D803C93EFF110E02DD210C"
4826 DATA "FADDE5CDC204DDE1DD4E0BDD560CDD5E"
4842 DATA "0D3E0B1CBB20141E013E500CB9200C0E"
4858 DATA "003E0214BA20040E02183BDD710BDD72"
4874 DATA "0CDD730D7A3DEEFFE6506FAF47675709"
4890 DATA "29E5C1292909192B7DE6073C0603A7CB"
4906 DATA "1CCB1D10F9111AFC194E3D2804CB1918"
4922 DATA "F93CA128A34FAF47"
4930 DATA "C9","*"
4938 RANDOMIZE USR 65215
```

* * * * * * * * * *

BARGAIN CORNER

CENTRONICS GLP PRINTER very good condition. Only £100. Owner
upgrading to larger printer. Contact Brian Ashley. Phone
Hillingdon (Middlesex) 0895 444805.

---

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Huddersfield (0484) 640950.

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TRAP THAT ERROR.

Isn't it annoying when a program stops because of a stupid error. Isn't it even more annoying when you could have recovered from the error if only you were able to TRAP it. Well the DISCiPLE has an error TRAP facility although it has never been documented, until now that is. It will only work on version 3 ROM DISCiPLEs and will trap both DISCiPLE and Spectrum errors although some, mostly within an INPUT or PRINT statement, may cause some unpredictable results.

This is, alas, not an ON ERROR GOTO type of trapping, instead you must test for an error after the statement you think an error might occur in. Location 23728, a spare byte in the Spectrum's System Variables, is used to signal to the DISCiPLE that you wish to trap errors. If 23728 is non zero then the Spectrum/DISCiPLE will not halt with a message when an error is encountered. Your program will instead continue with the next instruction, but the system variable 'ERR NR'(23610) will contain the error number.

Try this short routine and you will see how things work.

```
10 LET trap=23728: LET errnr=23610
20 POKE trap,255
30 ERASE d1"NOSUCHFILE"
40 LET err=PEEK errnr: IF err<>255 THEN PRINT "Error Type ";err
50 POKE trap,0: POKE errnr,255
```

Line 50 resets the trap so the program can finish correctly. You will see that error type 26 has been reported, from the table below you will see error number 26 is 'File NOT FOUND'.

DISCiPLE ERROR MESSAGES

0	Nonsense in GDOS	17	Invalid CODE
1	Nonsense in GNOS	18	Reading a WRITE file
2	Statement END error	19	Writing a READ file
3	BREAK requested	20	O.K. GDOS 3
4	SECTOR error	21	Network OFF
5	FORMAT data lost	22	Wrong DRIVE
6	NO DISC in drive	23	Disc write PROTECTED
7	No "SYSTEM" file	24	Not enough SPACE on disc
8	Invalid FILE NAME	25	Directory FULL
9	Invalid STATION	26	File NOT FOUND
10	Invalid DEVICE	27	END of file
11	VARIABLE not found	28	File NAME used
12	VERIFY failed	29	Not a MASTER station
13	Wrong FILE type	30	STREAM used
14	MERGE error	31	CHANNEL used
15	CODE error	32	* Used by Command Codes *
16	PUPIL set	33-127	NOT USED.

Error codes >= 128 are the Spectrum error codes with 128 added (bit 7 set), for a full list of these see the Spectrum manual.
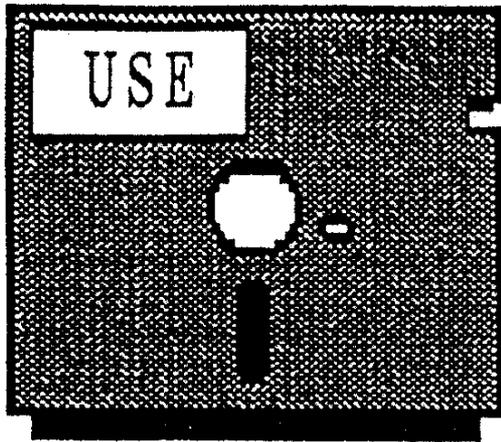
USERS SOFTWARE EXCHANGE

The User Software Exchange, or USE for short, was detailed in the original INTRODUCTORY issue of format. Several members have spoken to me recently, asking when (or if) USE was going to get off the ground.

Well, when I produced the Intro issue (way back in May) I did think there would be a large amount of Public Domain Software around, that would form the basis of the USE library. Alas, unlike most computers, the Spectrum seems to be very short of PDS and despite much searching I have only been able to locate a few rather old items. If any member knows of any Public Domain items then please let me know as soon as you can.

Another problem exists due to different disc formats. 5.25 inch is still the favorite with 3.5 inch closing fast. But what about 40 or 80 track, single or double sided, single or double density, all need to be catered for and thats without taking 3 inch drives into account.

It will be obvious from the above that a rethink was needed and its taken a little time to come up with what we hope will be the right system. Several very good programs have already been received from members (but we still need many more). Some, which are too big for listing in FORMAT, will be made available under the new system. Any program listed in FORMAT will also be available. In addition we are commissioning special items of software where we feel there is a demand.

Starting next month we will carry a monthly list of software for sale to INDUG members. The software will be supplied on tape, for easy transfer to disc, thus keeping costs as low as possible.
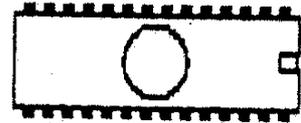
Each tape, which may contain from 1 to 4 programs, will cost £3.95 or £4.95 including airmail postage for overseas members. Instructions are supplied where needed and all tapes are professionally recorded.

So watch out for the first list in next months issue.

B.B.
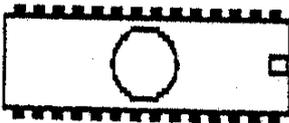
HARDWARE SPOT
RS232 INTERFACE
By Keith Naylor.

This month we will look at the construction, testing and operation of the RS232 interface we started last month.

CONSTRUCTION

The prototype was constructed on standard Veroboard using wirewrapping technique. Connection to the Disciples bus was achieved using a readily available flexible bus connector. Simply position the IC holders on the board and insert a wirewrap pin along side each point requiring a connection. Now follow the diagram (see last months issue) and make the nessesary connections.

TESTING

For test purposes the REQUEST TO SEND output should be linked to the CLEAR TO SEND input, and the TRANSMIT DATA output linked to the RECEIVE DATA input. This will allow data to bE transmitted and received without the use of any external equipment. With these connections made, the following Basic and Machine Code routines will serve to transmit numbers from 0 to 255 and check to see the numbers are received.

"BYTES" The machine code.

```
        ORG 50000        ;start of code
        LD HL,50100      ;load memory pointer
WAIT1   IN A,(127)       ;read status port
        AND 1            ;mask out TxRDY bit
        JP Z,WAIT1       ;wait until ready to accept char
        LD A,(50101)     ;get value to transmit
        OUT (119),A      ;send character
WAIT2   IN A,(127)       ;read status port
        AND 2            ;mask out RxRDY bit
        JP Z,WAIT2       ;wait until character received
        IN A,(119)       ;input character
        LD (HL),A        ;save character in memory
        RET              ;return to Basic
```

"RS232" The Basic program.

```
  10 CLS:LOAD D*"BYTES"CODE 50000
  20 OUT 127,254:OUT 127,53
  30 LET X=0
  40 POKE 50101,X
  50 RANDOMIZE USR 50000
  60 PRINT "DATA :";PEEK 50100
  70 IF PEEK 50100<>X THEN PRINT"MISSMATCH ERROR":STOP
  80 LET X=X+1
  90 IF X=256 THEN LET X=0
 100 POKE 23692,255
 110 GOTO 40
 120 OUT 127,64:OUT 127,254:OUT 127,53:GOTO 30
```

The MODE,COMMAND and STATUS formats are outlined below :

MODE

BAUD RATE FACTOR		CHARACTER LENGTH		PARITY OPERATION		NUMBER OF STOP BITS	
D0	D1	D2	D3	D4	D5	D6	D7
0 sync mode	0	0 <5 bits>	0	0 parity disable	0 odd	0 <invalid>	0
1 < 1X	0 >	1 <6 bits>	0	1 parity enable	1 even	1 < 1 bit	0 >
0 < 16X	1 >	0 <7 bits>	1			0 <1.5 bits>	1
1 < 64X	1 >	1 <8 bits>	1			1 <2 bits	1 >

COMMAND
D0 TRANSMIT ENABLE   1=enable 0=disable
D1 DATA TERMINAL READY   1= /DTR to zero
D2 RECEIVE ENABLE   1=enable 0=disable
D3 SEND BREAK CHARACTER   1= forces TXD "low"
D4 ERROR RESET   1=reset error flags PE,OE,FE
D5 REQUEST TO SEND   1= /RTS to zero
D6 INTERNAL RESET   1= returns 8251 to MODE instruction
D7 ENTER HUNT MODE   1=enable hunt for sync characters

STATUS
D0 TxRDY   DB Buffer Empty
D1 RxRDY   Receiver Ready (Character received)
D2 TxEMPTY   No characters to transmit
D3 PE   Parity Error
D4 OE   Overrun Error
D5 FE   Framing Error
D6 SYNDET   Sync Detect
D7 DATA SET READY   Indicates that DSR is at a zero level

NOTES:- Line 20 starts by sending a MODE word (254) followed by
the COMMAND word (53). This is because the 8251 will be waiting
to be configured after it has been powered up.

MODE WORD 254=16X Baud rate factor:8 bits character
length:Enable Even Parity:2 Stop Bits.
COMMAND WORD 53=Transmit enable:DTR not valid:Receive Enable:No
Break Char: Reset Error Flags:/RTS to "low":No internal reset:No
Hunt mode.

The program will loop indefinitely (until the BREAK key is
operated) and can be used as a simple performance check,
particularly at the highest Baud rate (9600). If the program is
stopped then it should be restarted from line 120.

It should be possible to alter the DISCiPLE's printer routines
to drive the RS232 port but I will leave that to someone else.

THE HELP PAGE

SECTOR ERROR

I keep getting a 'Sector Data Error' on discs. I use top quality
discs DS/DD 96tpi and follow all the rules given for handling
discs. What can I do?

P.Alerton. London.

The problem may be dirt on your disc drive heads so it may be
worth buying a cleaning disc (available from BOOTS or most
computer stores) and using it about once a month. However the
more common cause is the STEP RATE you set in your system file.
I recommend 6ms for 3.5" drives and 12ms for 5.25", but some
units require even slower rates. Old 5.25" drives may need 48ms
or even longer. Use POKE @3 to reset the rate and then do a few
SAVEs & LOADs. This problem also occurs more often if files
become fragmented by repeated ERASEing and SAVING. So copy all
your files to a fresh disc once in a while to clean up the
fragments.

TASWORD TO DISC

When I used Tasword 2 on microdrive, I sometimes printed the
text to a file. I would like to do the same on the DISCiPLE, any
idea how I can do this?

Peter Millson. Leeds.

Due to a bug in the DISCiPLEs ROM this can't be done using
Channel 3 (the printer Channel) but if you OPEN#4;d1;"file" OUT
then POKE 60039,4 Tasword 2 will then use channel 4 for its
printing.

DATA SAVING

I am trying to save a data file to disc with the files name held
in N$. but I get an error when the line SAVE d1N$ DATA (f) is
reached. Whats wrong?

Alan Cox. Kent.

The DISCiPLE's ROM looks for a drive number, 'D' or 'd' followed
by a number or a'*'. It needs however a delimiter, to tell it
that it has reached the end of the number. When you SAVE
d1"FILENAME" the '"' at the start of the name also acts as the
delimiter for the drive number. If you store the file's name in
a string variable you need to add a ';' into the line to do the
same job, so SAVE d1;N$ DATA (f) will pass the DISCiPLE's syntax
checks.

That's all we have room for this month..